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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/770,017	01/25/2001	Masayoshi Kobayashi	P/2291-98	5189

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EXAMINER	
NGUYEN, TAM V	

ART UNIT	PAPER NUMBER
2172	3

DATE MAILED: 04/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PPG

Office Action Summary	Application No.	Applicant(s)	
	09/770,017	KOBAYASHI, MASAYOSHI	
	Examiner	Art Unit	
	Tam V Nguyen	2172	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 January 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. Claims 1-23 are pending in this office action. Claims 1-23 are presented for examination. This office action is in response to the filing dated 01/25/01.

Priority

2. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 112

3. Claim 13 recites the limitation "The search system further comprising" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. The claimed invention is directed to non-statutory subject matter.

With respect to claims 1-5 are non-statutory because the claims are not tangibly embodied on a computer readable medium. Claims 1-5 are tree structure in and of itself is insufficient to define a data structure and non-functional descriptive material.

With respect to claims 6-8 are non-statutory because the claims are not tangibly embodied, not in technological arts, and not currently limited to being computer implemented.

With respect to claims 9-11 are non-statutory because the claims are not tangibly embodied-software per ser.

With respect to claims 16 is non-statutory because none-functional descriptive material on a medium as claimed, the tree structure is not tangibly embodied on the medium, and the tree structure not claimed on medium.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ahn (US 5848409).

With respect to claims 1 and 16, Ahn discloses a tree structure in which the items of data are stored, (col. 2, lines 56-60, each node also stores one or more pointer to the group index table 204) except for a portion of the items of data corresponding to a sub-tree structure, which is a selected portion of an assumed tree structure formed by all the items of data, (col. 2, lines 56-60, in fig. 2, group tree 202). Ahn discloses a group tree contain plurality of nodes pointer to group index table; however, Ahn does not clearly teach "an equivalent table storing the portion of the items of data in table form". Ahn shows each node has a value and two branches, where the left branch is less than the value, and the right branch is greater than the value. Each node also stores one or more pointers to the group index table 204, (col. 2, lines 65-67). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made

to employ the group index table taught in Ahn, so the system is capable of searching through individual documents, or groups of documents, and the system can locates one or more hit entries in a group hits table associated with a keyword in a search request.

As to claims 2 and 17, Ahn further discloses wherein the tree structure includes a plurality of nodes, each of which is composed of a node information flag, a plurality of pointers each corresponding to predetermined branches, and related information, wherein each of the pointer indicates one of its child nod, the equivalent table, and null, (see fig. 2), and the equivalent table includes a plurality of entries, each of which is composed of a table node information flag, a tail entry flag, a data bit string, a search bit length, and related information, (col. 3, lines 19-23, the database administrators predetermined the information or the values to be stored in the table).

As to claims 3 and 18, Ahn further discloses wherein the data bit string is arranged so that a length of the data bit string is equal to that of search data, wherein the search bit length indicates a length of an original data bit string to match with the search data, (col. 3, lines 24-29).

As to claims 4 and 19, Ahn further discloses wherein the entries in the equivalent table are store at consecutive locations in memory, (fig. 2, group table 204).

As to claims 5 and 20, Ahn further discloses an amount of memory required to store the data structure is smaller than that required to store the assumed tree structure, (col. 2, lines 56-60); and search performance of the data structure is not lower than that of the assumed tree structure, (col. 2, lines 65-col. 3, lines 4).

As to claims 6 and 21, Ahn discloses a forming an assumed tree structure in which all the items of data are stored, (col. 2, lines 56-60); sequentially selecting a node from the assumed tree structure to select a sub-tree structure designated by the selected node, (col. 2, lines 56-60); determining whether the elected sub-tree structure satisfies the following conditions: an amount of memory required to store a data structure including the equivalent table in place of the selected sub-tree structure is smaller than that required to store the assumed tree structure, (col. 2, lines 56-60); search performance of the data structure is not lower than that of the assumed tree structure, (col. 2, lines 65-col. 3, lines 4); and when the selected sub-tree structure satisfies the condition (1) and (2), replacing the selected sub-tree structure with the equivalent table to construct the data structure, (col. 2, lines 65-col. 3, lines 4). Ahn discloses a group tree contain plurality of nodes pointer to group index table; however, Ahn does not clearly teach "forming an equivalent table storing a portion of the items of data corresponding to the selected sub-tree structure in a table form". Ahn shows each node has a value and two branches, where the left branch is less than the value, and the right branch is greater than the value. Each node also stores one or more pointers to the group index table 204, (col. 2, lines 65-67). Therefore, it would have been

obvious to one of ordinary skill in the art at the time the invention was made to employ the group index table taught in Ahn, so the system is capable of searching through individual documents, or groups of documents, and the system can locates one or more hit entries in a group hits table associated with a keyword in a search request.

As to claims 7, 10, 14, and 22, Ahn further discloses the condition (1) is that, when the selected sub-tree structure is replaced with the equivalent table to form a new data structure, a maximum search time Tmax_t calculated from the new data structure doe not exceed a maximum search time Tmax calculated from the assumed tree structure, (col. 2, lines 65-col. 3, lines 4); and the condition (2) is that, when the selected sub-tree structure is replaced with the equivalent table to form a new data structure, a necessary amount of memory for the new data structure is smaller than that for the assumed tree structure, (col. 2, lines 65-col. 3, lines 4).

As to claims 8, 11, 15, and 23, Ahn further discloses wherein a decision on whether the condition (1) is satisfied is made depending on whether the following equation is satisfied: ND < NL x K = Te/Tn, where Nd is the number of items of data included in the selected sub-tree structure, Nl is the number of levels of the selected node or lower in the assumed tree structure, Tn is search time per node, and Te is search time per entry in the equivalent table, (col. 2, lines 65-col. 3, lines 4).

With respect to claims 9 and 13: an apparatus: see analyzed of claim 6.

With respect to claim 12, Ahn further discloses a memory storing a data structure in which items of data are stored for search,(col. 6, lines 1-4, the computer memory) the data structure comprising: a tree structure in which the items of data are stored except for a portion of the items of data corresponding to a sub-tree structure, which is a selection portion of an assumed tree structure formed by all the items of data, (col. 2, lines 56-60); a search section for searching the data structure for an item of data matching input search data, (col. 4, lines 4-46). Ahn discloses a group tree contain plurality of nodes pointer to group index table; however, Ahn does not clearly teach "an equivalent table storing the portion of the items of data in table form". Ahn shows each node has a value and two branches, where the left branch is less than the value, and the right branch is greater than the value. Each node also stores one or more pointers to the group index table 204, (col. 2, lines 65-67). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the group index table taught in Ahn, so the system is capable of searching through individual documents, or groups of documents, and the system can locates one or more hit entries in a group hits table associated with a keyword in a search request.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Josep et al. (US 5862386) shows apparatus and method for providing a facility for managing versions and configurations of persistent and transient objects.

Curtis et al. (US 6278992B1) shows search engine using indexing method for storing and retrieving data.

Anderson et al. (US 4774657) shows index key range estimator.

Sarkar (US 5687361) shows system for managing and accessing a dynamically expanding computer database.

Bertin et al. (US 5606669) shows system for managing topology of a network in spanning tree data structure by maintaining link table and parent table in each network node.

Contact Information

8. **Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tam V Nguyen whose telephone number is (703) 305-3735. The examiner can normally be reached on 7:30AM-5: 00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim Yen Vu can be reached on (703) 305-4393. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7239 for formal communications and (703) 746-7240 for informal communications.

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, Virginia 22202. Fourth Floor (Receptionist).

10. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

JEAN M. CORRIELUS
PRIMARY EXAMINER

TV:tv

4/01/03